

## CLAIMS:

1. A synthetic peptide selected from the group consisting of:

(i) a peptide of at least 12 and at most 30 amino acid residues based on a  
5 complementarity-determining region (CDR) of the heavy or light chain of a pathogenic anti-  
DNA monoclonal antibody that induces a systemic lupus erythematosus (SLE)-like disease  
in mice (hereinafter CDR-based peptide), a salt or a chemical derivative thereof;

(ii) an analog of a CDR-based peptide defined in (i), a salt or a chemical derivative  
thereof;

10 (iii) a dual synthetic peptide comprising two such peptides of (i) or analogs of (ii)  
covalently linked to one another either directly or through a short linking chain;

(iv) a peptide polymer comprising a plurality of sequences of said peptide (i) or  
analog thereof (ii); and

(v) a peptide polymer (iv) attached to a macromolecular carrier.

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2. A synthetic peptide according to claim 1, capable of:

(i) inhibiting specifically the proliferative response and cytokine secretion of T  
lymphocytes of mice that are high responders to SLE-inducing autoantibodies; or

(ii) inhibiting development of SLE in mice that are susceptible to SLE-induction by  
20 pathogenic autoantibodies.

3. A synthetic peptide according to claim 1 or 2, being selected from the  
group consisting of peptides having the sequences I to V herein, wherein:

(i) the peptide of sequence I has the formula:

T G Y Y X<sub>1</sub> X<sub>2</sub> X<sub>3</sub> X<sub>4</sub> X<sub>5</sub> Q S P E K S L E W I G [I]

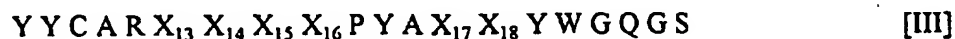
25 wherein X<sub>1</sub> is Met, Ala or Val; X<sub>2</sub> is Gln, Asp, Glu or Arg; X<sub>3</sub> is Trp or Ala; X<sub>4</sub> is  
Val or Ser; and X<sub>5</sub> is Lys, Glu or Ala;

(ii) the peptide of sequence II has the formula:

E I N P S T G G X<sub>6</sub> X<sub>7</sub> X<sub>8</sub> X<sub>9</sub> X<sub>10</sub> X<sub>11</sub> X<sub>12</sub> K A K A T [II]

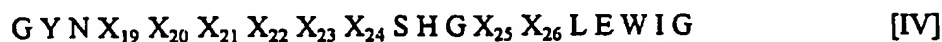
wherein  $X_6$  and  $X_7$  are each Thr, Val or Ala;  $X_8$  is Tyr or Phe;  $X_9$  is Asn or Asp;  $X_{10}$  is Gln or Glu; and  $X_{11}$  is Lys or Glu, and  $X_{12}$  is Phe or Tyr;

(iii) the peptide of sequence III has the formula:



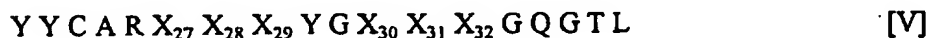
5 wherein  $X_{13}$  is Phe, Thr or Gly;  $X_{14}$  is Leu, Ala or Ser;  $X_{15}$  is Trp or Ala;  $X_{16}$  is Glu or Lys;  $X_{17}$  is Met or Ala, and  $X_{18}$  is Asp, Lys or Ser;

(iv) the peptide of sequence IV has the formula:



10 wherein  $X_{19}$  is Met or Ala;  $X_{20}$  is Asn, Asp or Arg;  $X_{21}$  is Trp or Ala;  $X_{22}$  is Val or Ser;  $X_{23}$  is Lys or Glu;  $X_{24}$  is Gln or Ala;  $X_{25}$  is Lys or Glu, and  $X_{26}$  is Ser or Ala; and

(v) the peptide of sequence V has the formula:



wherein  $X_{27}$  is Ser or Phe;  $X_{28}$  is Gly or Ala;  $X_{29}$  is Arg, Ala or Glu;  $X_{30}$  is Asn or Asp;  $X_{31}$  is Tyr or Phe, and  $X_{32}$  is Trp, His or Ala.

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4. A peptide according to claim 3, having a sequence Ia of the formula:



5. A peptide according to claim 3, having a sequence IIa of the formula:



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6. A peptide according to claim 3, having a sequence IIIa of the formula:



7. A peptide according to claim 3, having a sequence IVa of the formula:



8. A peptide according to claim 3, having a sequence Va of the formula:

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9. A dual synthetic peptide according to claim 1 or 2, in which two different sequences I to V in claim 3 are covalently linked to one another either directly or through a short linking chain.

10. A dual synthetic peptide according to claim 9, in which two different  
5 sequences of the peptides Ia to Va are linked covalently.

11. A peptide polymer according to claim 1, containing a plurality of identical sequences selected from the sequences I to V in claim 3.

12. A pharmaceutical composition for the treatment of systemic lupus erythematosus comprising an effective amount of a synthetic peptide or peptide polymer  
10 according to any one of claims 1 to 11, and a pharmaceutically acceptable carrier.

13. A pharmaceutical composition for the treatment of systemic lupus erythematosus comprising an effective amount of a mixture of at least two different peptides in accordance with any one of the claims 3 to 10.

14. A method for the treatment of systemic lupus erythematosus comprising  
15 administering to a systemic lupus erythematosus patient an effective amount of a peptide or peptide polymer according to any one of claims 1 to 11.

15. A method of selecting peptides capable of inhibiting the proliferative response of T lymphocytes from a SLE patient, comprising:

(i) synthesizing a peptide of at least 12 and at most 30 amino acid residues,  
20 having a sequence based on the CDR region of the heavy or light chain of a pathogenic anti-DNA monoclonal antibody that induces a SLE-like disease in mice, or an analog thereof;

(ii) testing said peptide or analog for its ability to inhibit the proliferative response of T cells from a SLE patient, or a T cell line or clone which is specific to the 16/6 Id anti-DNA monoclonal antibody to which the T cells are specific; and

25 (iii) selecting and producing said peptide only if it is capable of inhibiting said proliferative response.